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Published <i>With international search report.</i>		
(54) Title: TATTOOING ASSEMBLY		
(57) Abstract		
Tattooing apparatus including a vibratable housing (20) carrying a tattooing needle (60) and a source of tattooing pigment (100) coupled by flexible tubing (110) to said needle (60) through a peristaltic pump (163) by which the flow of pigment to the needle is controlled.		

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TATTOOING ASSEMBLY

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of application serial no. 07/481,944 filed 02/20/90.

BACKGROUND OF INVENTION

Tattooing is performed by means of a sharp, small diameter needle or cluster of needles which is dipped in a tattooing pigment. The needle, or needle unit, carrying pigment is vibrated into the skin to be tattooed. The needle is carried as a unit in a housing which includes means for vibrating the needle.

At the present time, the practice of dipping the needle into an ink or pigment is undesirably time consuming and inefficient. In order to obtain dark, permanent tattoos it is important to use adequate amounts of pigment on the points of the tattoo needle. In the process of dipping the needle into the pigment, if the needle is not dipped sufficiently frequently, a pale, poorly visible tattoo will result. Frequent dipping is time consuming and there is the ever-present danger of the needle striking a hard object and being damaged when dipped into the ink supply. In addition to the economic loss when the needle is damaged, the damaged needle, if used, will cause pain while tattooing. The damaged point may also macerate the skin tissue and produce local trauma which activates white blood cells (phagocytes). The phagocytes engulf the pigment particles and carry them away from the tattoo site and this results in fading of the tattoo as well as edema, inflammation, swelling and bleeding at the tattoo site.

Some tattooing apparatus is known which uses a reservoir or ink or pigment to supply the needle with pigment without dipping. However

such apparatus cannot regulate pigment flow and the pigment constantly runs out of the reservoir and covers the entire tattoo site as well as the tattooist. This makes it difficult to see the tattoo site and the excess pigment must be cleaned away, thus wasting time and pigment.

The present invention solves this problem by providing a novel arrangement for coupling a source of tattooing ink directly to the tattoo needle unit whereby ink is constantly and controllable available and present on the needle unit as the tattooing operation is performed.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of apparatus embodying the invention;

FIG. 2 is an elevational view of a needle used with the holder of FIG. 1.

FIG. 3 is a schematic representation of apparatus embodying the invention; and

FIG. 4 is a rear view of a portion of the apparatus of FIG. 3.

DESCRIPTION OF THE INVENTION

The principles of the present invention may be used with substantially any type of tattooing machine however it is described herein in connection with a tattoo machine and needle assembly described and claimed in U.S. Patent No. 4,771,660 which is incorporated herein by reference. Since all of the features of a working tattooing apparatus after shown in that patent, they will not all be shown and described herein.

The needle and needle-holder assembly 10 used in practicing the invention and shown in the above-identified patent includes a vibrator made up of a U-shaped housing 20 including an upper leg 30, a lower

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leg 32 and a connecting leg 40. The upper leg is made up of a rigid armature bar 44 and a rearwardly projecting spring-like metal strip 46 which secures the bar 44 to the side leg 40. Electrical coils 50 are mounted on the housing 20 for use in causing the upper arm 30 to vibrate.

The leading end of the upper leg 30 and the front vertical surface of bar 44 carry a projecting pin 54 for coupling a tattooing needle 60 thereto by its ring or eye 92. The leading end of the lower leg 32 is formed with a horizontally disposed split ring 64 which is adapted to receive a needle holder 70 and carries a threaded wing nut 68 for securing the needle holder therein.

The needle holder 70 comprises a hollow metal tube 73 having a longitudinal slot 82 in its wall extending from the upper end 71 of the tube to near the lower end. A tattooing needle 90 is seated in the slot 82 in tube 73 and is accessible at the lower end thereof.

The tattooing apparatus 10 described above is operated in conjunction with a pigment container 100 having a threaded top and suitably positioned. The pigment tube contains the desired pigment, medication or other desired substance. A length of flexible tubing 110 is inserted in a tiny hole in the cap 101 and is secured thereto by means of polyethylene tape. The tube 110 extends from the pigment bottle 100, looped through an apertured connector 103 and then lead alongside the needle shaft 60 and its remote end is secured to the tattoo needle near the lower operating end thereof.

The looping of the tubing 110 through the connector 103 prevents the tubing from being accidentally pulled away from the tattooing apparatus and it also keeps the tubing out of the way of the tattooer.

As the tubing is directed from container 100, it may be threaded over the wing nut 68 or a suitable bracket may be provided on the wing nut shaft holder to guide the tubing.

According to the invention, the flow of pigment from container 100 is controlled by means of a smaller peristaltic metering pump 163 as illustrated in Figs. 3 and 4. The apparatus shown in Figs. 3 and 4 includes a housing 123 which contains the electronics used in the system and pump 163 is a micro-peristaltic pump. The source of pigment or medication 100 which may be sterile is connected by tubing 110 to the pump 163 and to a crimped tube 120 which is secured to the tattooing needle and holds the tubing 110 in place thereat.

The electronic apparatus in the housing 193 includes means for having a 12 volt power supply 165 connected thereto and with a connection 167 to a foot pedal 171 for turning the pump off and on. A connection 173 is also provided for coupling power to the tattooing apparatus 10.

The housing 163 also includes, referring to Fig. 8, a rheostat 175 for controlling voltage applied to the pump 163 and a rheostat 177 for controlling voltage applied to the tattooing apparatus 10. Connections 181 and 183 for the leads to the foot switch and tattooing machine are also provided on the rear of the housing.

With the arrangement described, the rate of feed of pigment or medication is finely and precisely controlled by the rheostat 175. In addition, the pump rheostat 175 can be used to turn off the power to the pump whereby the tattooing machine can be operated without the pump for a desired period of time.

The system using a pump has the advantage that it approximately doubles tattooing speed and produces darker, easily legible tattoos. The apparatus also reduces needle damage and it reduces tissue build

up between the needle points. It also permits the operator to provide fresh pigment for each animal and reduces pigment wastage. It also keeps pigment free of contamination.

It is noted that the vibratory motion of the tattooing needle as it is being operated agitates the tubing 110 which carries pigment thereto and thereby facilitates the movement of pigment toward the tip of the tattoo needle. This motion also constantly mixes the pigment in the tubing and prevents clogging of the tubing.

What is claimed is:

1. A tattooing apparatus comprising a tattooing needle having an operating end adapted to penetrate the skin of a subject, a source of tattooing pigment, a flexible tube having a first end and a second end, said first end being secured to said source of pigment and said second end being secured to said needle near said operating end thereof whereby tattooing pigment can flow from said source and through said flexible tube to said operating end of said needle; and a peristaltic pump coupled to said flexible tube for controlling the flow precisely from said source of pigment to said tattooing needle.
2. The apparatus defined in claim 1 and including control means for controlling the voltage applied to said pump and to said tattooing needle.
3. The apparatus defined in claim 1 wherein said pump is a micro-peristaltic pump.
4. The apparatus defined in claim 1 and including a housing containing said pump and electronics for operating said pump and other apparatus, electrical power coupled to said housing, an electrical connection from said housing to said tattooing needle, a foot pedal connected to said housing and said pump whereby said pump can be operated by foot, a rheostat coupled to said housing in the circuit for operating said tattooing needle, and a second rheostat coupled to said housing and said pump for controlling the speed of operation of said pump.

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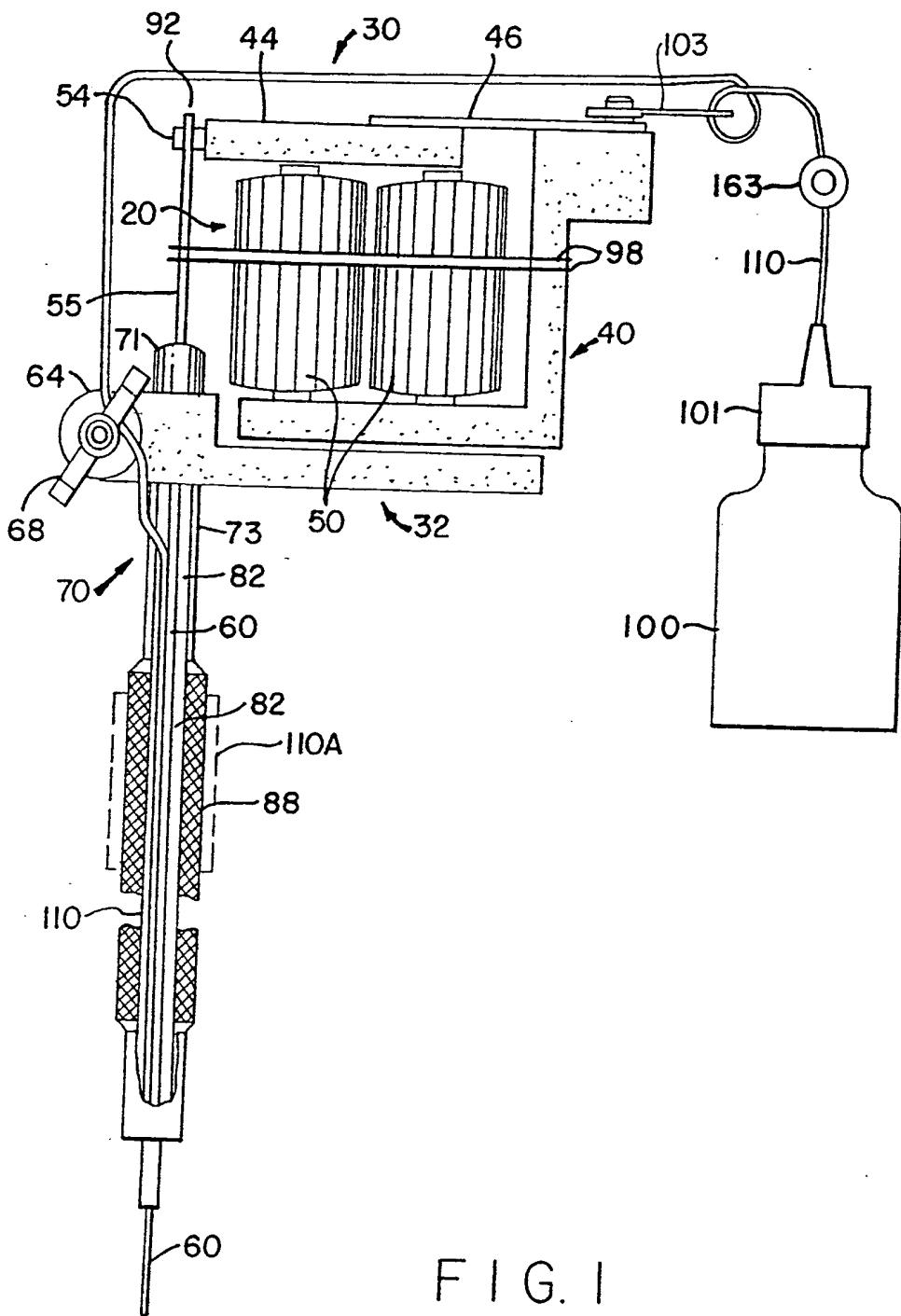
5. Tattooing apparatus comprising a housing,
an elongated tattooing needle seated in said housing and having
a tattooing end,

means coupled to said housing for vibrating said housing,
a source of tattooing pigment, and
a flexible tubing having one end secured to said source and
having its other end secured to said needle near said tattooing end
thereof whereby tattooing pigment can flow from said source to said
needle where it is injected into the skin.

6. The apparatus defined in claim 5 wherein said tubing extends
along said tattooing needle.

7. The apparatus defined in claim 5 wherein said housing
includes a longitudinal slot in which said tattooing needle is seated
and said source of tattooing pigment comprises a container secured to
said housing.

8. The apparatus defined in claim 5 and includes means guiding
said tubing from said source of tattooing pigment to said slot in
which said tubing extends to a point of attachment on said tattooing
needle.



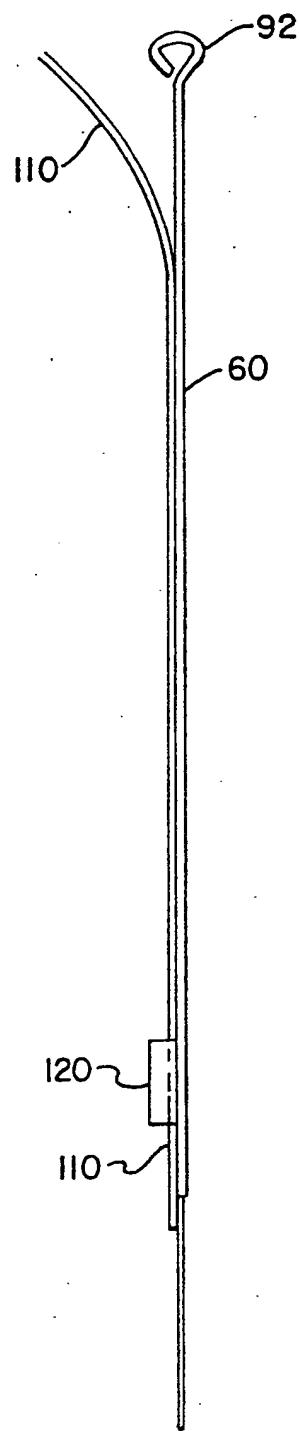


FIG. 2

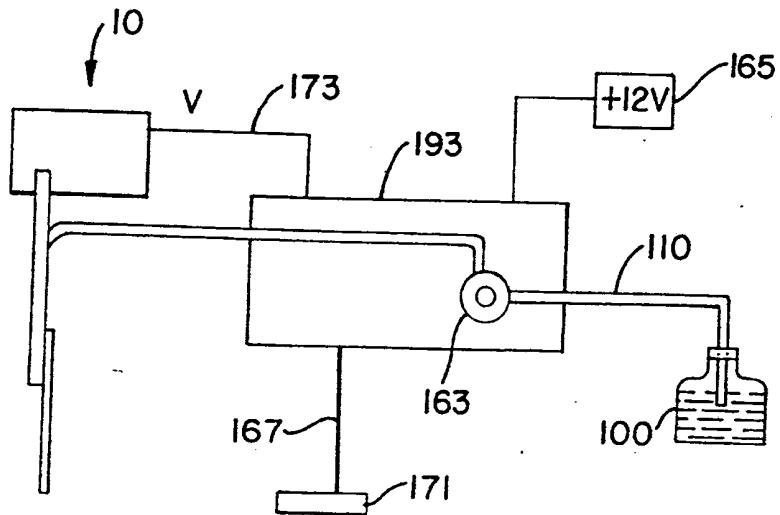


FIG. 3

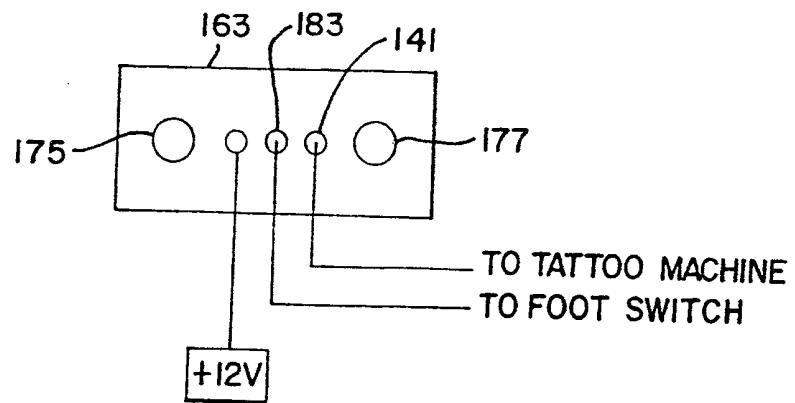


FIG. 4

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US91/07160

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶

According to International Patent Classification (IPC) or to both National Classification and IPC
 IPC (5): B26F 1/24; A61B 17/20
 U.S.CI.: 81/9.22

II. FIELDS SEARCHED

Minimum Documentation Searched ⁷

Classification System	Classification Symbols
U.S.	81/9.22 604/46,47,183-186,257 606/184,185,186

Documentation Searched other than Minimum Documentation
to the Extent that such Documents are Included in the Fields Searched ⁸

III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹

Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	US, A, 0,304,613 (CAREY) 02 September 1884 See entire document.	1-8
A	US, A, 0,473,207 (CAREY) 19 April 1892 See entire document.	1-8
A	US, A, 0,768,413 (WAGNER) 23 August 1904 See entire document.	1-8
A	US, A, 1,724,812 (WATERS) 13 August 1929 See entire document.	1-8
A	US, A, 2,437,920 (OVERTON) 16 March 1948 See entire document.	1-8
A	US, A, 4,671,277 (BEUCHAT) 09 June 1987 See entire document.	1-8
A	US, A, 4,715,853 (PRINDLE) 29 December 1987 See entire document.	1-8
A	US, A, 4,771,660 (YACOWITZ) 20 September 1988 See entire document.	1-8

* Special categories of cited documents: ¹⁰

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"Z" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search

06 January 1992

Date of Mailing of this International Search Report

21 JAN 1992

International Searching Authority

ISA/US

Signature of Authorized Official

ADRIENNE NGOC-HO

INTERNATIONAL DIVISION

Fr Roscoe V. Parker, Jr. *[Signature]*

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

A	US, A, 4,798,582 (SARATH ET AL.) 17 January 1989 See entire document.	1-8
A	US, A, 4,914,988 (CHANG) 10 April 1990 See entire document.	1-8
A	GB, A, 0,013,539 (SOUTH) 30 June 1899 See entire document.	1-8
A	IT, A, 0,266,682 (MAGNANI) 07 August 1929 See entire document.	1-8

V. OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE:

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. Claim numbers _____, because they relate to subject matter ¹² not required to be searched by this Authority, namely:

2. Claim numbers _____, because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out ¹², specifically:

3. Claim numbers _____, because they are dependent claims not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING:

This International Searching Authority found multiple inventions in this international application as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

- The additional search fees were accompanied by applicant's protest.
- No protest accompanied the payment of additional search fees.